SERIES
SEISMIC ENGINEERING RESEARCH INFRASTRUCTURES FOR
EUROPEAN SYNERGIES

Workpackage [WP2]
Deliverable [D2.3] – [Preliminary version of Distributed Database and Data Access Portal]

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ABSTRACT

This deliverable presents design and implementation issues related to the preliminary version of the SERIES Data Access Portal (DAP). The Data Access Portal is developed following a user-centred iterative design cycle aiming to provide useful and usable services related to information retrieval functionalities to a wide range of stakeholders, organizations and individuals. The objective of this deliverable is to provide a short overview of the preliminary version of the SERIES Data Access Portal of the SERIES project which is public accessible and can be reviewed in detail through the following unified resource location address: http://www.dap.series.upatras.gr.

Keywords: Data Access Portal, Series Distributed Database
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1 Conceptual and Architectural Design of the Data Access Portal

1.1 CONCEPTUAL DESIGN DECISIONS

From a conceptual point of view the Data Access Portal has been designed to act as an information space. Organizing functionality and content into a structure that users are able to navigate intuitively is not a trivial task. Researching the suitable Information Architecture of the DAP environment is of great importance. Effective information architecture enables users to step logically through a system aiming to supporting them getting closer to the information they require. Lacking a suitable Information flow increases the risk of creating great content and functionality that no one can ever find. The proposed Information Architecture is based on the fact that the content is not going to be created by a group of administrators or content authors. The content will be mostly fed into the system by the distributed databases that are maintained on the laboratories sides. However, the distributive character of the database makes the decision of the suitable information containers much more difficult. Two questions are the most prominent in this decision process:

- What is important and for whom?
- What has to be accessible and for whom?

The Information Architecture of the system needs to provide rational answers to these questions satisfying the majority of – if not all – users. The proposed platform uses a “Pull” (or self-subscribe) rather than a “Push” model for the Information flow and the Notification system, in order to fulfil the above statement. That means, that each user selects what is important for him and thus reaches it with less effort (“Push” functionality regarding the notification of users could be available, but that does not reflect the general philosophy of the platform).

In terms of user interaction functionalities the Data Access Portal supports two complementary modes of information retrieval: a) direct search functionality and b) direct navigation functionalities which are explained further in the Data Access Portal overview section.
1.2 ARCHITECTURAL DESIGN DECISIONS

From an architectural point of view, the Data Access Portal has been designed to support two different external actors:

- The external users who will interact with the SERIES web portal in order to perform information retrieval tasks and
- The Laboratory Web Services, which will interact with the Central Site (more specifically with the Central Web Service) in order to exchange content and configuration. The security model which will be used among the Web Services for their communication has been described in previous deliverables.

![Diagram of External Actors](image)

**Figure 1: External Actors of the SERIES Central Site**

From a software component point of view, as shown in Figures 2 and 3, the Data Access Portal consists of the following components:

- the SERIES distributed database, which entails the searchable part of the published projects
- the SERIES central web services, which communicate with the laboratories in order to exchange information on published projects but as well configuration settings related to privacy issues
- the SERIES web server, which also hosts the Data Access Portal which is shortly described in this deliverable
A more detailed component view, which entails as well the software components relying on the laboratory side, can be seen in Figure 3.

Figure 3: Component View of the SERIES and Laboratories Site
2 Overview of the Data Access Portal

The aim of the SERIES Data Access Portal is to provide a centralized way for accessing all the public projects from the SERIES community. The Data Access Portal presents the information of the available projects by following the structure of the Exchange Data Format (Deliverable 2.1) and having a basic understanding of EDF is considered mandatory for understanding how the DAP is structured. The DAP provides a brief description of what EDF is.

2.1 SEARCH Functionality

2.1.1 Search criteria composition

The search functionality of the DAP is a structured keyword-based search. Keywords are separated according to the level that they are belonging to. Representative users are able to select any of the desired keywords from each category and click on the search button. The creation of complex queries is also supported by allowing a user to make multiple selections, as shown in Figure 4.

![Figure 4: The Search Functionality](image)

2.1.2 Search results presentation

The search results are presented in a structured approach as it can be seen in Figure 5, embracing the description of each project and direct links to the download and the detailed project description web pages. This way a brief overview is presented for each project providing the opportunity to a user to navigate directly to the download page.
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Furthermore, the search results are also displayed on a tree control on the left panel of the web page in which, the EDF levels that contain the search criteria are marked with red.

2.2 DIRECT NAVIGATION FUNCTIONALITY

The Data Access Portal supports also a direct navigation mechanism aiming to allow users to browse through the published projects by interacting with a tree view control which is always visible at the left side of the web application. This panel contains all the available published projects which are structured according to the Exchanged Data Format. Expanding a project node the specimen level, experiment level, computation level and signal level are presented, as shown in Figure 7.
2.3 PROJECT DETAILS PRESENTATION

As shown in Figure 8 the project info tab presents some general information about the selected project like:

1. The starting and ending date of the project
2. The sponsor of the project
3. A brief description of the project
4. The project investigators
5. The infrastructure of the project

By selecting the “Detailed Information Tab” a user can see detailed information at the Specimen, Computation, Experiment and Signal level as described in the next sections.
2.3.1 Project Specimen Level

The information included in the specimen level, as depicted in Figure 9, is related to the following:

1. Specimen data
2. Structural elements
3. Structural element material
4. Material nominal properties
5. Material actual properties
6. Specimen documents
7. Specimen images
8. Scaling

Figure 9: The Specimen Level

2.3.2 Project Computation Level

The information included in the computation level provides information related to:

1. General computation data
2. Computation agents
3. Computation document
4. Computation images
5. Detailed loading characteristics (DLCH)
6. Original loading signal (OLS)
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7. Mesh model
8. Mesh model images
9. Computer system and software

Figure 10: The Computation Level

2.3.3 Project Experiment Level

The experiment level provides the information, as depicted in figure 11, which is related to:

1. General experiment data
2. Experiment agents
3. Experiment document
4. Experiment images
5. Experiment video
6. Detailed Loading Characteristics (DLCH)
7. Original Loading Signal (OLS)
2.3.4 Project Signal Level

The signal level provides the information that is related to attributes, physical and type attributes of the signal as depicted in figure 12.

2.3.5 Downloadable Items Tabs

The downloadable items of the project are summarized on this tab, they can be directly downloaded by a single click and are related to:

1. Project documents
2. Specimen documents
3. Specimen images
4. Mesh model images
5. Mesh model documents
6. Experiment Images
7. Experiment videos
8. Experiment documents
9. Computation images
10. Computation documents
11. Input and output signals
Figure 13: The Download Items Tab

By selecting a downloadable item the user needs to agree first on the “SERIES Terms and Conditions Agreement” and afterwards he/she will be redirected to the laboratory where the downloadable item is actually being kept. The aforementioned “Server-Laboratory” interaction is performed in a transparent way to the final user, who is able to open the downloadable item as if it would have been kept on the DAP Server (Figure 14).

Figure 14: The Downloadable Items
3 Conclusions

This deliverable presented briefly the preliminary version of the SERIES Data Access Portal (DAP). The DAP is developed by following a user centred design approach (UCD) which is an iterative process of requirements engineering, designing, developing and evaluating. As a consequence the preliminary version is an excellent evaluation space aiming to investigate whether the current design supports effective and efficient information retrieval tasks related to published experiments. The feedback from partners will be taken into consideration during the subsequent development cycle of the DAP and which, among others, will entail the development of the access control relating to published experiments.